

## WEST Search History

[Hide Items](#) | [Restore](#) | [Clear](#) | [Cancel](#)

DATE: Thursday, September 07, 2006

<u>Hide?</u>	<u>Set Name</u>	<u>Query</u>	<u>Hit Count</u>
<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ</i>			
<input type="checkbox"/>	L7	(vitamin adj B6) same L1	27
<input type="checkbox"/>	L6	(vitamin adj B6) same L4	1
<input type="checkbox"/>	L5	vitamin same L4	2
<input type="checkbox"/>	L4	(clone or recombinant) same L3	21
<input type="checkbox"/>	L3	express\$5 same L2	151
<input type="checkbox"/>	L2	(gene or sequence or polynucleotide) same L1	251
<input type="checkbox"/>	L1	((erythronate-4-phosphate adj dehydrogenase)or (4-phosphoerythronate adj dehydrogenase)or (phosphoerythonate adj dehydrogenase) or pdx?)	815

END OF SEARCH HISTORY

[ExPASy Home page](#)    [Site Map](#)    [Search ExPASy](#)    [Contact us](#)    [ENZYME](#)    [Swiss-Prot](#)  
 Search   for

## NiceZyme View of ENZYME: EC 1.1.1.290

### Official Name

**4-phosphoerythronate dehydrogenase.**

### Alternative Name(s)

**4-O-phosphoerythronate dehydrogenase.**

**4PE dehydrogenase.**

**Erythronate-4-phosphate dehydrogenase.**

### Reaction catalysed

4-phospho-D-erythronate + NAD(+)  $\leftrightarrow$  (3R)-3-hydroxy-2-oxo-4-phosphonoxybutanoate + NADH

### Comment(s)

- This enzyme catalyzes the second step in the biosynthesis of the coenzyme pyridoxal 5'-phosphate in *Escherichia coli*.
- The reaction occurs predominantly in the reverse direction.
- Other enzymes involved in this pathway are EC 1.2.1.72, EC 2.6.1.52, EC 1.1.1.262, EC 2.6.99.2 and EC 1.4.3.5.

### Cross-references

PROSITE                    PDOC00063

BRENDA                    1.1.1.290

PUMA2                    1.1.1.290

PRIAM enzyme-specific profiles                    1.1.1.290

Kyoto University LIGAND chemical database                    1.1.1.290

IUBMB Enzyme Nomenclature                    1.1.1.290

IntEnz                    1.1.1.290

MEDLINE                    Find literature relating to 1.1.1.290

MetaCyc                    1.1.1.290

Q8A2E4, PDXB\_BACTN; Q7VRU9, PDXB\_BLOFL; Q83AR8, PDXB\_COXBU;  
 Q8XCR0, PDXB\_ECO57; Q8FFH2, PDXB\_ECOL6; P05459, PDXB\_ECOLI;  
 Q6D2N5, PDXB\_ERWCT; Q7N2B2, PDXB\_PHOLL; Q6LNU2, PDXB\_PHOPR;  
 Q7MV70, PDXB\_PORGI; Q9I3W9, PDXB\_PSEAE; Q88L20, PDXB\_PSEPK;



## ENZYME: 1.1.1.290

[Help](#)

**Entry** EC  
1.1.1.290 Enzyme

**Name** 4-phosphoerythronate dehydrogenase;  
PdxB;  
PdxB 4PE dehydrogenase;  
4-O-phosphoerythronate dehydrogenase

**Class** Oxidoreductases  
Acting on the CH-OH group of donors  
With NAD<sup>+</sup> or NADP<sup>+</sup> as acceptor

**Sysname** 4-phospho-D-erythronate:NAD<sup>+</sup> 2-oxidoreductase

**Reaction** 4-phospho-D-erythronate + NAD<sup>+</sup> =  
(3R)-3-hydroxy-2-oxo-4-phosphonooxybutanoate + NADH + H<sup>+</sup>  
[RN:R04210]

**Substrate** 4-phospho-D-erythronate [CPD:C03393];  
NAD<sup>+</sup> [CPD:C00003]

**Product** (3R)-3-hydroxy-2-oxo-4-phosphonooxybutanoate [CPD:C06054];  
NADH [CPD:C00004];  
H<sup>+</sup> [CPD:C00080]

**Comment** This enzyme catalyses the second step in the biosynthesis of the coenzyme pyridoxal 5'-phosphate in *Escherichia coli*. The reaction occurs predominantly in the reverse direction [3]. Other enzymes involved in this pathway are EC 1.2.1.72 (erythrose-4-phosphate dehydrogenase), EC 2.6.1.52 (phosphoserine transaminase), EC 1.1.1.262 (4-hydroxythreonine-4-phosphate dehydrogenase), EC 2.6.99.2 (pyridoxine 5'-phosphate synthase) and EC 1.4.3.5 (pyridoxamine-phosphate oxidase).

**Reference**

1 [PMID:2121717]  
Lam HM, Winkler ME.  
Metabolic relationships between pyridoxine (vitamin B6) and serine biosynthesis in *Escherichia coli* K-12.  
*J. Bacteriol.* 172 (1990) 6518-28.

2 [PMID:11844765]  
Pease AJ, Roa BR, Luo W, Winkler ME.  
Positive growth rate-dependent regulation of the *pdxA*, *ksgA*, and *pdxB* genes of *Escherichia coli* K-12.  
*J. Bacteriol.* 184 (2002) 1359-69.

3 [PMID:8550422]  
Zhao G, Winkler ME.  
A novel alpha-ketoglutarate reductase activity of the *serA*-encoded 3-phosphoglycerate dehydrogenase of *Escherichia coli* K-12 and its possible implications for human 2-hydroxyglutaric aciduria.  
*J. Bacteriol.* 178 (1996) 232-9.

4 [PMID:2692566]